CLAIMS

1. A transponder device, comprising:

a radio frequency identification transponder configured to operate in a plurality of modes and to change modes of operation in accordance with the strength of a received radio frequency signal.

2. The transponder device of claim 1, wherein each mode of operation is activated and deactivated independent of the other modes of operation in response to the strength of the radio frequency signal.

3. The transponder device of claim 1, wherein the transponder is configured to operate in a passive mode when within a first distance form the transceiver, and in an active mode when within a second distance from the transceiver that is closer to the transceiver than the first distance.

4. The transponder device of claim 1, wherein the transponder is configured to deactivate all modes that are not operational.

5. The transponder device of claim 1, wherein the transponder is configured to activate only one mode of operation at a time.

6. A transponder device, comprising:

a radio frequency identification tag configured to operate in a passive mode for backscatter operations and to operate in an active mode for transmission of a radio frequency signal, the passive mode and the active mode selected in response to a received radio frequency interrogation signal.

7. The transponder device of claim 6, wherein the mode is selected in response to the strength of the interrogation signal.

8. A transponder device, comprising:

a radio frequency identification tag configured to operate in a first mode when at a first distance from a radio frequency signal source, to operate in a second mode when at a second distance that is closer to the radio frequency signal source than the first distance, and in a third mode when at a third distance that is closer to the radio frequency signal source than the second distance, the first, second, and third modes selected in response to receipt of a radio frequency signal transmitted from the radio frequency signal source.

9. The transponder device of claim 8, wherein the mode is selected in response to the strength of the transmitted radio frequency signal.

10. The transponder device of claim 8, wherein the transponder is configured to deactivate all modes that are not operational.

11. A radio frequency transponder architecture, comprising:

a micro-power oscillator configured to obtain sufficient power from a received radio frequency signal to oscillate and be detectable at a first distance, a ROM-based circuit that obtains sufficient power from the received radio frequency signal at a second distance that is shorter than the first distance to the source of the radio frequency signal to modulate an identification code preprogrammed in a memory of the ROM-based circuit, and a CMOS microcontroller configured to receive sufficient power from the received radio frequency signal at a third distance that is shorter than the second distance to the source of the radio frequency signal to perform at least one from among read operations, write operations, monitoring of external inputs, and generating control signals for controlling external devices.

12. The architecture of claim 11, wherein each mode of operation is activated and deactivated independent of the other modes of operation in response to the strength of the radio frequency signal.

13. The architecture of claim 11, wherein the transponder is configured to deactivate all modes that are not operational.

14. The architecture of claim 11, wherein the transponder is configured to activate only one mode of operation at a time.

15. A communication system, comprising:

a transceiver configured to transmit a radio frequency signal and to receive a response signal; and

a transponder configured to operate in a plurality of modes and to activate modes of operation in response to only the strength of the radio frequency signal.

16. The system of claim 15, wherein the transceiver is configured to vary the strength of the transmitted radio frequency signal.

17. The system of claim 15, wherein each mode of operation is activated and deactivated independent of the other modes of operation in response to the strength of the radio frequency signal.

18. The system of claim 15, wherein the transponder is configured to operate in a passive mode when within a first distance from the transceiver, and in an active mode when within a second distance from the transceiver that is closer to the transceiver than the first distance.

19. The system of claim 15, wherein the transponder is configured to deactivate all modes that are not operational.

20. The system of claim 15, wherein the transponder is configured to activate only one mode of operation at a time.

21. The system of claim 15, wherein the transponder comprises a microcontroller having at least one input and at least one output for communication with external devices.